Physical Review D - Particles, Fields, Gravitation and Cosmology 2005 vol.71 N12

Anisotropic cosmological models with nonminimally coupled magnetic field

Balakin A., Zimdahl W.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Motivated by the structure of one-loop vacuum polarization effects in curved space-time we discuss a nonminimal extension of the Einstein-Maxwell equations. This formalism is applied to Bianchi I models with magnetic field. We obtain several exact solutions of the nonminimal system including those which describe an isotropization process. We show that there are inflationary solutions in which the cosmological constant is determined by the nonminimal coupling parameters. Furthermore, we find an isotropic de Sitter solution characterized by a "screening" of the magnetic field as a consequence of the nonminimal coupling. © 2005 The American Physical Society.

http://dx.doi.org/10.1103/PhysRevD.71.124014